DEC STD 010-0 Engineering Documentation Checking: General Requirements

DOCUMENT IDENTIFIER: A-DS-EL00010-00-0000 Rev C1, 10-May-1990

ABSTRACT: It is the responsibility of the Engineering Services organization to check engineering documentation for conformance to Digital standards and to control the release and ECO of this documentation. This standard defines what checking should be done, as well as what information is needed to support the checking process.

APPLICABILITY: Mandatory for all personnel involved in the release of documentation to the Engineering Design Libraries. These requirements pertain not only to documentation format and content, but also to tolerances necessary to the overall design of a product.

STATUS: APPROVED 10-May-1990; use VTX SMC for current status.

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Responsible Department:	Engineering Support Operations
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APPROVAL: This standard has been reviewed and recommended for approval by the General Review group for its category.

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1 INTRODUCTION

All documentation to be released to Engineering Design Libraries and distributed through site micrographics groups must have the required signatures. The individuals signing the document, ECO, and associated paperwork acknowledge by their signature that the document has been checked and conforms to the requirements for acceptance in their area of responsibility. Engineering Services sites provide the capability for checking documentation. Referenced and related documents are listed at the end of this section.

1.1 PURPOSE

The purpose of the standard is to define the responsibilities of the checker in the release and ECO of engineering documentation.

1.2 RESPONSIBILITIES

1.2.1 Design Engineer

The design engineer is responsible for meeting the signature and checking requirements in the design, sign-off, and release of engineering documentation as described in this standard and *DEC STD 140 Documentation, Data, and Release Requirements for Printed-Wiring Boards, Modules, and Backplanes* (all sections). The responsible design engineer has the option of checking certain features of his drawing (see subhead 2).

1.2.2 Engineering Services

Site design/drafting services and site design libraries are responsible for meeting the requirements of this standard.

2 REQUIREMENTS

Documents that are submitted to Design Services must meet the following requirements for checking and release:

a. Documentation is correct. It has the correct title, document identifier, and notes.

b. Documentation meets approved microfilm standards and other Digital standards.

c. Must conform to form, fit, and function. Tolerances and materials must be accurate.

NOTE

Engineering can assume checking responsibility for item c (see subhead 2.4.5). Engineering cannot assume responsibility for items a and b. The checker should always check to see that the document conforms to *DEC STD 182-0 Engineering Documentation Acceptance Criteria.*

2.1 GENERAL ENGINEERING DOCUMENTATION

Prior to releasing newly created drawings, a checker must verify the drawing(s) for accuracy, completeness, and clarity. The checker must also ensure that applicable Digital standards are met where design and documentation are concerned.

2.2 MECHANICAL AND ELECTRICAL ENGINEERING DOCUMENTATION

The checker must verify that drawings clearly represent production and assembly requirements as defined by applicable Digital standards. The checker must also verify drawings for functional fit and conformance to design and/or schematic layouts. See subhead 2.

2.3 SPECIAL-PURPOSE ENGINEERING DOCUMENTATION

The checker must ensure that proper recording of revision indicators, signatures, dates, and other data occurs on Tables of Contents, Drawing Directories, Parts Lists, and other special documents.

2.4 CHECKING PROCEDURES

2.4.1 Design/Drafting Data

All applicable layouts, basic dimensional calculations, tolerance studies, catalogs, design memoranda, reference prints, copies of purchase specifications, PDQ (Pre-design Producibility Questionnaire) forms, and other pertinent data must be forwarded by the draftsperson to the checker at the time design plots/blue prints of drawings are submitted to checking.

2.4.2 Check Prints

The checker shall use a check print to convey corrections and verifications. Using a check print avoids defacing the drawing and provides a record from which the checker can make a final check. The checker may initial the checker's block after the first check, but the final check and checker's signature should await the completion of all pre-release changes or PCAs (Preliminary Change Authorizations). Upon completion of the final check, the checker will sign and date original drawings and the checked prints. If electronic media is used, upon approval, the names of the responsible individuals will be entered in the title/approval block.

After the sign-off of a new document (or when an unreleased document is canceled), the checked prints and obsolete documents, if any, shall be filed or stored in drafting for a minimum of three months.

2.4.3 Color Codes For Changes

The checker's verification of correct dimensions, callouts, notes, and so forth, is indicated by a yellow line drawn through the applicable data.

Incorrect data is marked in red and the correct information is lettered adjacent to the point in question with a green marking.

Questionable data on the drawing is indicated by a question mark, drawn with a blue pencil and accompanied by an explanatory note. Checker's suggestions, general comments on design features, simplification possibilities, or the checker's own notes are made with a color other than red, yellow, or green.

2.4.4 Design/Drafting Changes After Checking

After the initial checking, at which time the checker may initial the checker's block, any changes made to that document can be made only with the engineer's approval. Changes made after the initial checking and before the checker's final signature shall follow the appropriate pre-release change or PCA procedures.

Changes requested by the checker shall be coordinated with the responsible engineer prior to incorporation if the changes affect the existing design. Each major change shall have a separate check print (blue line) or plot and have a unique pre-release revision indicator for each pass as required by *DEC STD 012-0 Part Identification Standard.*

Additional changes that might be identified while correcting the unreleased drawing are marked on the checked print in a color other than red, yellow, or green (reserved for the checker) and initialed by the responsible engineer or designer. A new check print of the corrected drawing and the marked-up checked print are resubmitted to the checker to verify all changes.

2.4.5 Sign-Off of Checked Documents

After routine checking procedures and all approvals and signatures are completed, the document is ready to be released to a site Design Library. The checker signs and dates the document first, in the Checker's Block, and then the responsible engineer and manufacturing representative sign.

Sometimes a design engineer may request that Design Services check only a portion of a document or the documentation requirements only (see DEC STD 182-0). In this case, the checker is not obligated to sign the drawing but should initial the title block to show that the drawing was checked for that purpose. The responsible engineer will then sign the Checker's Block, assuming responsibility for the checking function. See subhead 2.

2.4.6 Checking of ECOs to Documents

When an Engineering Change Order (ECO) is issued to a particular drawing, the checker will receive the ECO facesheet, the original ECO marked-up print, and the new drawing. The change to the drawing indicated on the ECO facesheet is to be checked. Also, a tolerance check should be made to insure that no other problems occur as a result of the ECO. When the check is completed, the ECO block on the drawing is initialed by the checker, per *DEC STD 100-0 Policy and Requirements for the Product Change Process*. Revision changes must comply with DEC STD 012-0.

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00012-00	*DEC STD 012-0 Part Identification Standard*
EL-00100-00	*DEC STD 100-0 Policy and Requirements for the Product Change Process*
EL-00140-00	*DEC STD 140-0 Documentation, Data, and Release Requirements for Printed-Wiring Boards, Modules, and Backplanes - Introduction*
EL-00182-00	*DEC STD 182-0 Engineering Documentation Acceptance Criteria*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

APPENDIX B RELATED DOCUMENTS

B.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00006-00	*DEC STD 006-0 Assigning Part Descriptions and Document Titles*
EL-00012-01	*DEC STD 012-1 Documentation Identification Conventions Including Mnemonic Codes*
EL-00012-02	*DEC STD 012-2 Unified Numbering Code for Part Identifier Class Codes*
EL-00012-03	*DEC STD 012-3 Packaged System Identification Standard*
EL-00012-07	*DEC STD 012-7 Unified Numbering Code - 74 Class Part Numbering Conventions and Assignment Procedures*
EL-00012-09	*DEC STD 012-9 Unified Numbering Code - 94-Class Tool Numbering Conventions and Assignment Procedures*
EL-00013-00	*DEC STD 013-0 Standard Engineering Drawing Formats and Forms - Introduction*
EL-00015-00	*DEC STD 015-0 Abbreviations and Units of Measurement*
EL-00020-00	*DEC STD 020-0 Cast Metal Parts*
EL-00022-00	*DEC STD 022-0 Cable and Harness Documentation: Part Identification Requirements*
EL-00022-01	*DEC STD 022-1 Cable and Harness Documentation: Drawing Requirements for 70-Class and Option Numbers*
EL-00024-00	*DEC STD 024-0 Top Document Requirements*
EL-00025-00	*DEC STD 025-0 Parts Lists*
EL-00026-00	*DEC STD 026-0 Documentation Requirements and Process for Internally-Designed Hybrid Assemblies*
EL-00030-00	*DEC STD 030-0 Module Manufacturing Standard - Introduction and General Information*
EL-00056-00	*DEC STD 056-0 Circuit Diagrams and item Designations - General Requirements*
EL-00056-01	*DEC STD 056-1 Symbology - Distinctive Shape Logic Symbols*
EL-00056-02	*DEC STD 056-2 Symbology - Complex (Uniform Shape) Logic Symbols*
EL-00056-03	*DEC STD 056-3 Symbology - Discrete Electronic and Electromechanical Component Symbols*
EL-00056-04	*DEC STD 056-4 Symbology - Electrical Interconnections Between Graphic Symbols*
EL-00056-05	*DEC STD 056-5 Circuit Diagrams and Item Designations - Diagrams and Symbols*
EL-00056-06	*DEC STD 056-6 Symbology - Glossary of Terms*
EL-00056-07	*DEC STD 056-7 Symbology - Logic Function Labels and Pin Label Definitions*
EL-00060-00	*DEC STD 060-0 Design of Hardware Products to National and International Regulations and Standards, Policies and Procedures*
EL-00092-00	*DEC STD 092-0 Finish and Color Standard - Introduction and General Requirements*
EL-00112-00	*DEC STD 112-0 Standard Date Format for Output*
EL-00114-00	*DEC STD 114-0 Engineering Drawing Requirements - Industry Standards Adopted by Digital Engineering and Manufacturing Documentation Organizations*

EL-Class Number	Document Title
EL-00114-01	*DEC STD 114-1 Engineering Drawing Requirements - Dimensioning and Tolerancing for Engineering Drawings*
EL-00116-00	*DEC STD 116-0 Workmanship Standards Manual - Introduction*
EL-00117-00	*DEC STD 117-0 Print Sets*
EL-00119-00	*DEC STD 119-0 Digital Product Safety - Introduction and General Requirements*
EL-00126-00	*DEC STD 126-0 Packaged Systems Documentation Structure*
EL-00140-01	*DEC STD 140-1 Documentation Requirements for Printed-Wiring Boards (50-Class)*
EL-00140-02	*DEC STD 140-2 Documentation Requirements for 54-Class Modules and Backplanes*
EL-00140-03	*DEC STD 140-3 Documentation Requirements for Backplanes (50, 54, and 70-Class)*
EL-00140-05	*DEC STD 140-5 Prototype Release Requirements for Printed-Wiring Boards, Modules, and Backplanes*
EL-00140-06	*DEC STD 140-6 Production Release Requirements for Printed-Wiring Boards, Modules, and Backplanes*
EL-00140-07	*DEC STD 140-7 Engineering-Supervised Build (ESB) Release Requirements for Printed-Wiring Boards, Modules, and Backplanes*
EL-00176-00	*DEC STD 176-0 Printed-Wiring Board Acceptance Criteria*
EL-00176-01	*DEC STD 176-1 Printed-Wiring Board Repair Criteria*
EL-00176-02	*DEC STD 176-2 Printed-Wiring Board Product Safety Criteria*
EL-00178-00	*DEC STD 178-0 Digital Identification Marking Requirements - Introduction*
EL-00179-00	*DEC STD 179-0 Requirements for Specifying Raw Materials for Powder-Metal Parts*
EL-00185-00	*DEC STD 185-0 Documentation of Computer Media in the Engineering Documentation System*
EL-00195-00	*DEC STD 195-0 Requirements for Releasing Unigraphics Data Bases*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

B.2 Other Documents

Document Number	Document Title
ANSI/AWS A2.4-79	*Symbols for Welding and Nondestructive Testing*

- The Option/Module List can be obtained from the Chief Engineer's Office MLO3-3/H14, DTN: 223-2886.

The ANSI/AWS document can be obtained from:

- American Welding Society
  2501 NW 7th Street, Miami, Florida 33125

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